ICP/EXT-04-00659
Revision 1

Field Sampling Plan for TSF-09/18 V-Tanks Phase I Treatment

January 2006

Idaho Cleanup Project

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January 2006

Idaho Cleanup Project

Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Operations Office
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Approved by

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REVISION RECORD

Revision Number and Date	DESCRIPTION	Comments
0 January 2005	Original Issue.	
1 January 2006	Revised to update project organization and references. Revised to update information per the current approach for recirculation and air sparging as addressed in Revision 3 to RD/RAWP Addendum 2.	This is a minor change per RD/RAWP definition and does not require Agency review.

ABSTRACT

This Field Sampling Plan establishes the procedures and requirements for conducting sampling of treated V-tank contents waste after Phase 1 treatment (air-sparging) to confirm the non-characteristic nature of the waste, determine if the treated waste meets the land disposal restrictions treatment standards for organic constituents, and to determine the extent of additional treatment during Phase 2, if necessary. This sampling and analysis activity supports the TSF-09/18 V-tanks remediation for Operable Unit 1-10 at Test Area North.

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TABLES

ACRONYMS

AA	alternate action
ALARA	as low as reasonably achievable
BEHP	Bis-2-ethylhexyl phthalate
CERCLA	Comprehensive Environmental Response Compensation Liability Act
CFC-11	trichloromonofluoromethane
CFC-113	1,1,2-trichloro-1,2,2-trifluoroethane
COC	contaminant of concern
COPC	contaminants of potential concern
DAR	Document Action Request
DOE	U.S. Department of Energy
DOE-ID	Department of Energy, Idaho Operations Office
DOT	Department of Transportation
DQO	data quality objective
EDF	Engineering Design File
EPA	Environmental Protection Agency
ESH&QA	Environmental, Safety, Health, and Quality Assurance
ESP	Environmental Services Project
FFA/CO	Federal Facility Agreement/Consent Order
FTL	Field Team Leader
GC	gas chromatograph
GDE	Guide
HASP	health and safety plan
ICDF	INEEL CERCLA Disposal Facility
ICP	Idaho Completion Project
IDEQ	Idaho Department of Environmental Quality
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
LDR	land disposal restrictions
MCP	Management Control Procedure
mr/hr	millirem/hour
MS	mass spectrometry
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
OTL	operations technical lead
P&T	Packaging and Transportation Department
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PM	project manager

PPE	personal protective equipment
ppm	parts per million
PSQ	principle study question
QA	Quality Assurance
QA/QC	quality assurance/quality control
QAPjP	Quality Assurance Project Plan for Waste Groups 1,2,3,4,5,6,7,10 and Inactive Sites
RCRA	Resource Conservation and Recovery Act
RCT	radiological control technician
RD/RA	Remedial Design/Remedial Action
ROD	Record of Decision
RWP	Radiological Work Permit
SAM	Sample and Analysis Management
SIM	Selected Ion Monitoring
SOW	Statement of Work
STD	Standard
SVOA	semivolatile organic analysis
SVOC	semivolatile organic compound
TAN	Test Area North
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
TCP	TAN Completion Project
TCLP	toxicity characteristic leaching procedure
TEM	Template
TOS	task order statement
TSCA	Toxic Substance Control Act
UCL	upper confidence limit
UHC	underlying hazardous constituent
UTS	Universal Treatment Standard
VOA	volatile organic analysis
VOC	volatile organic compound
WAC	Waste Acceptance Criteria
WGS	Waste Generator Services

Field Sampling Plan for TSF-09/18 V-Tanks Phase I Treatment

1. INTRODUCTION

This Field Sampling Plan was prepared in support of Phase 1 treatment activities for the V-tank consolidated waste remediation project. Sampling will be performed by the Environmental Services Project (ESP) waste characterization samplers; the project will be tracked by ESP as ESP-122-04. The plan was prepared to sample the waste after sparging of Test Area North (TAN) consolidated waste from V-Tanks V-9, V-1, V-2, and V-3, and four additional minor volume waste streams (ARA-16 sludge, OU 1-07B sludge, unaltered V-tank samples, and liquid removed from the lines between the V-tanks and TAN 616). The characterization of materials specified in this Field Sampling Plan is required to confirm that the waste is non-characteristic, meets land disposal restrictions (LDRs) for disposal to the INEEL Comprehensive Environmental Response Compensation Liability Act (CERCLA) Disposal Facility (ICDF), and defines the approach as necessary for Phase 2 treatment. This activity, along with a comprehensive discussion of the V-tanks, is provided in DOE/NE-ID-11150, *Group 2 Remedial Design/Remedial Action Work Plan Addendum 2 for the TSF-09/18 V-Tanks and Contents Removal, Phase 1 Contents Treatment, and Site Remediation at Test Area North, Waste Area Group 1, Operable Unit 1-10* (DOE/NE-ID 2005).

Phase 1 treatment involves the use of air-sparging to reduce the level of halogenated hydrocarbons in the waste to reduce the potential for corrosion and to attempt to meet the applicable F001 and F005 treatment standards. If air-sparging is successful, then there may be no need to proceed with chemical oxidation. The waste would then be solidified and disposed of. For this reason, Addendum 2 of the Remedial Design/Remedial Action (RD/RA) Work Plan (DOE/NE-ID 2005) was revised (Rev. 2) to address the potential of not needing chemical oxidation. In addition, an Explanation of Significant Differences was prepared to address this change, since it would result in not having to proceed with the remedy selected in the 2004 Record of Decision (ROD; DOE, EPA, IDEQ 2004) Amendment.

Such a condition (not needing chemical oxidation prior to waste solidification) depends on the waste also not being characteristic. While Engineering Design File (EDF)-4885 (2004) addresses this assumption, the agencies (Department of Energy Idaho Operations Office [DOE-ID], Idaho Department of Environmental Quality [IDEQ], Environmental Protection Agency [EPA] Region 10) requested confirmation of the non-characteristic nature of the consolidated waste. Therefore, the primary purpose of Phase 1 treatment sampling is to confirm that the waste is non-characteristic and that it meets all F-listed treatment standards, following air-sparging activities. If the results indicate that the waste is non-characteristic, and that air-sparging does meet the F-listed treatment standards for the waste, the waste shall be solidified and disposed of at the ICDF, without additional chemical oxidation processing, as part of Phase 2 treatment. However, if the waste is found to be characteristic or air-sparging does not meet the F-listed treatment standards, then a secondary objective shall be to perform a preliminary laboratory study evaluating the degree of additional treatment (i.e., boiling or chemical oxidation) that may still be required prior to waste solidification and ICDF disposal.

This plan identifies the activities for the characterization project to perform sampling. The health and safety requirements will be addressed under a separate health and safety plan (HASP) (ICP 2005) and appropriate work control provided by TAN project personnel. This plan was prepared according to the requirements outlined in Idaho Completion Project (ICP) Management Control Procedure (MCP)-9439, "Environmental Sampling Activities at the INEEL" and, in general, with Template (TEM)-104, "Model for Preparation of Characterization Plans."

DOE-ID-10587, *Quality Assurance Project Plan for Waste Groups 1,2,3,4,5,6,7,10 and Inactive Sites* (DOE-ID 2004a) (QAPjP) governs Federal Facility Agreement/Consent Order (FFA/CO) project work performed by Idaho National Engineering and Environmental Laboratory (INEEL) employees, subcontractors, and employees of other companies or U.S. Department of Energy (DOE) laboratories.

This Field Sampling Plan and work control will establish the procedures and requirements that will be used to perform field sampling and analysis, as well as minimizing health and safety risks to persons sampling potentially hazardous and/or radioactive wastes resulting from V-tank consolidation operations. These documents contain information about the characterization activity, analytical and quality assurance/quality control (QA/QC) requirements, hazards involved in performing the task(s), and the specific actions and equipment that will be used to protect persons working at the task site.

1.1 Project Objectives

The objectives of this activity are to:

- Confirm the non-characteristic nature of the consolidated V-tank waste, particularly regarding the eleven trace organic constituents that could not be conclusively determined via earlier evaluations due to high detection levels in previous sampling efforts (see EDF-4885). These eleven organic constituents are as follows: 1,2-dichloroethane; benzene; 1,1-dichloroethylene; 2,4-dinitrotoluene; hexachlorobenzene; hexachlorobutadiene; hexachloroethane; nitrobenzene; pyridine; 2,4,6-trichlorophenol; and vinyl chloride.

- Determine if Phase 1 treatment activities (i.e., air-sparging) are effective in meeting F-listed treatment standards for the primary contaminants of potential concern (COPCs) in the waste (trichloroethylene [TCE], tetrachloroethylene [PCE], 1,1,1-trichloroethane [TCA], and toluene), as well as the other four trace organic contaminants that are identified as F001 constituents (carbon tetrachloride, methylene chloride, trichloromonofluoromethane [CFC-11], and 1,1,2-trichloro-1,2,2-trifluoroethane [CFC-113]).

- Determine level of treatment needed for Phase 2. If conditions of either bullet one or two above are not met, testing will identify appropriate level of treatment necessary for Phase 2 treatment.

In support of the non-characteristic confirmation objective, plans are to perform a toxicity characteristic leaching procedure (TCLP) analysis for hazardous metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) on the consolidated waste stream after sparging operations have been completed. This shall be done using standard analytical methods. Additional analyses or treatments on the consolidated waste will be performed, if necessary, to confirm the non-characteristic nature of the waste for the eleven trace organic constituents identified in EDF-4885. A summary flow chart for the non-characteristic waste confirmation objective, applied to the eleven trace organic constituents, is shown in Figure 1-1. The flow chart was prepared based upon discussions with the IDEQ. The agreed-upon approach was to remove the contaminants interfering with the analytical determination of the eleven trace contaminants that had previously been identified as inconclusive. Samples collected after the consolidated waste is sparged will be tested. If results are still inconclusive, lab-scale sparging at elevated temperatures (up to and including boiling) and/or chemical oxidation will be conducted to attempt to remove or destroy the interfering contaminants. Results from such studies will help define the conditions for batch processing of the waste as part of Phase 2 treatment (if Phase 2 treatment is required).

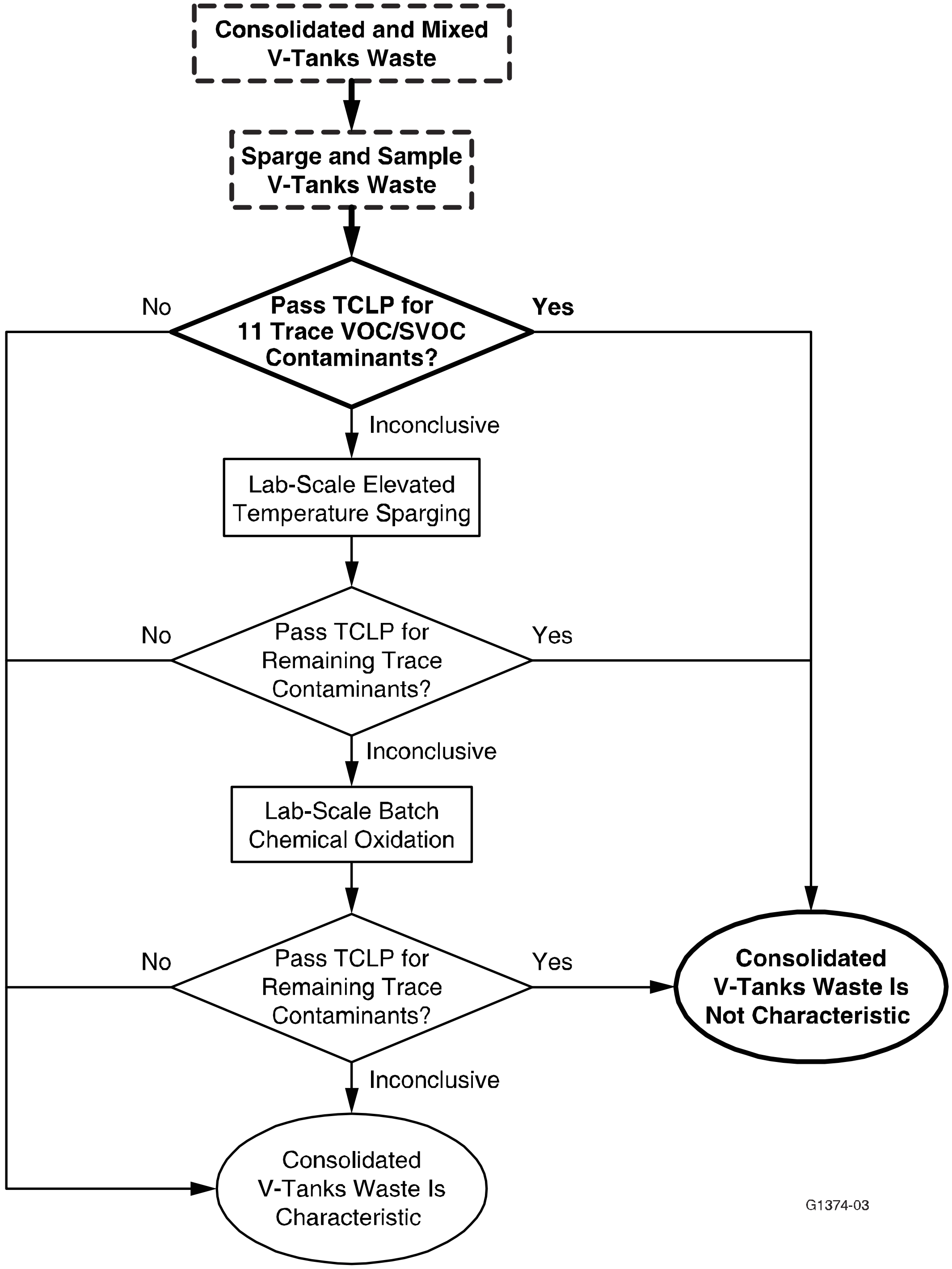

Figure 1-1. Flow chart for non-characteristic confirmation objective.

A summary flow chart for the Phase 1 treatment evaluation objective is shown in Figure 1-2. The figure shows the process for determining whether or not additional Phase 2 treatment will be required prior to solidification. If additional treatment is required, a secondary objective will be to determine the initial details of Phase 2 treatment.

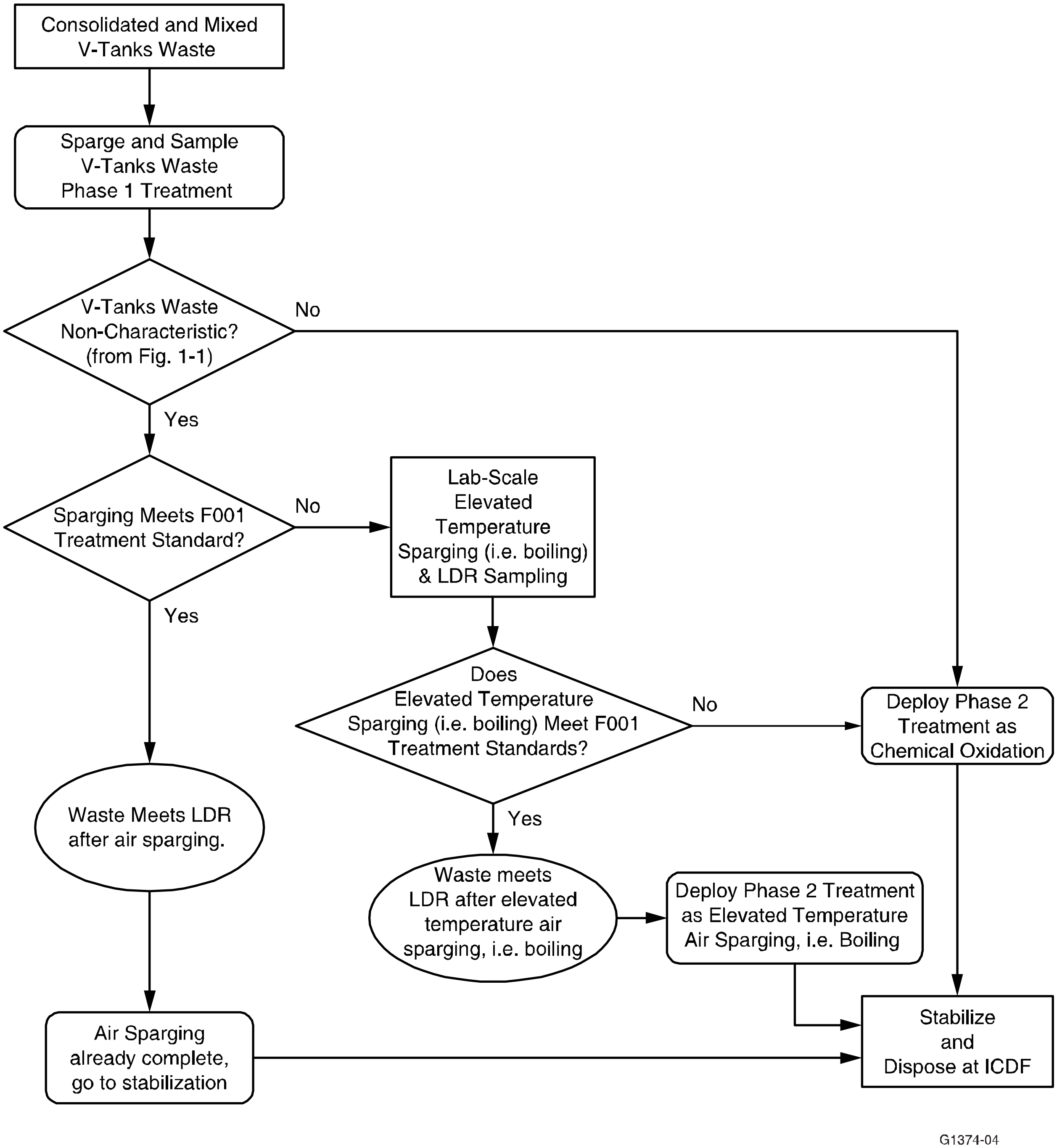

Figure 1-2. Determination of extent of Phase 2 treatment based on laboratory data.

1.2 Site and Waste Description

The site description of the Idaho National Engineering and Environmental Laboratory (INEEL) is provided in the QAPjP referenced in Section 1. The description of Test Area North (TAN) is also provided in the referenced QAPjP.

Test Area North is located at the north end of the INEEL, about 27 miles northeast of the Central Facilities Area. TAN was established in the 1950s by the U.S. Air Force and Atomic Energy Commission Aircraft Nuclear Propulsion Program to support nuclear-powered aircraft research. Upon termination of this research, the area's facilities were converted to support a variety of other DOE research projects. Today, TAN is composed of the Contained Test Facility (inactive) and the Technical Support Facility.

The V-tanks are being remediated as part of a Comprehensive Environmental Response Compensation Liability Act (CERCLA) response action covered by the Federal Facility Agreement/Consent Order (FFA/CO). This document is being prepared in support of the V-tanks Record of Decision (ROD) Amendment and Explanation of Significant Differences (DOE, EPA, IDEQ 2004).

The V-tanks are designated as INEEL CERCLA sites TSF-09 and TSF-18. These tanks were part of the Intermediate Level Radioactive Waste Management System at TAN (see Figure 1-3). The V-tanks include three l0,000-gal (37,850-L) underground storage tanks (Tanks V-1, V-2, and V-3) and one 400-gal (1,514-L) underground storage tank (Tank V-9).

After consolidating the V-tanks' waste into new consolidation tanks, additional minor volumes of similar wastes will be introduced into the consolidated waste stream (minor volumes of water may be used for rinsing containers). These minor waste streams and their volumes are:

- ARA-16 (80 gal, including 4.5 gal of sludge)
- Unaltered V-tank samples (50 gal, containing 16% sludge)
- OU 1-07B sludge (4 gal, all sludge)
- Residual waste in the lines between the V-tanks and TAN-616 (20 gal, containing 78% sludge).

A summary of the original waste estimates included in the V-tank remediation is shown in Table 1-1. The combined volume of waste in the tanks was originally estimated at approximately 12,000 gal (2,000 gal of sludge and 10,000 gal of liquid). Following the tank removal process, however, the total volume of V-tank waste collected, including rinse water, in the T-tanks is estimated to be 16,000 gal.

Table 1-1. Original estimates of consolidated waste volume contents (data rounded).

Tank	Liquid (gal)	Sludge (gal)	Total (gal)
V-1	1,160	520	1,680
V-2	1,140	460	1,600
V-3	7,660	650	8,310
V-9	70	250	320
ARA-16	75.5	4.5	80
Unaltered V-Tank Samples	42.1	7.9	50
OU 1-07B	0	4	4
V-Tanks to TAN-616 Lines Waste	4.4	15.6	20
Total	10,152	1,912	12,064

Source: EDF-4928, "Potential Feed Streams for Inclusion into V-tank Treatment Process," 2005.

The V-tanks, installed in the 1950s, were used to collect radioactive wastes during 30 years of operation. Wastes received were primarily the result of nuclear research activities. Tank V-9 served primarily as a solids separation unit, whereas the other tanks were designed for accumulation and storage. The tanks' contents consist of aqueous sludges contaminated with radionuclides, inorganic contaminants (including RCRA toxic metals), and toxic organic compounds (including trichloroethylene [TCE], tetrachloroethylene [PCE], and polychlorinated biphenyls [PCBs]). Nearly all of the contaminants in the V-tanks are found in the solid phase of the sludge.

Tables 1-2 and 1-3 list the mean and 90% upper confidence limit (UCL) concentrations of primary contaminants of concern in the consolidated waste that could affect the selection of an effective treatment remedy (DOE-ID, EPA, and IDEQ 2004). These values were used in evaluating the effectiveness and operability of various treatment alternatives. This evaluation led the agencies (DOE-ID, IDEQ, EPA Region 10) to select chemical oxidation/reduction with stabilization as the appropriate treatment process for this waste. The consolidated waste is expected to contain 93% water, 6% sludge, and 1.3% oil. The analytical laboratories utilized for this activity are expected to return the altered and unaltered sample materials to the INEEL due to a combination of the Nuclear Regulatory Commission (NRC) classification as Class B waste (which limits commercial waste disposal options), and the Toxic Substance Control Act (TSCA) nature of the waste, which forces the waste to be managed at a concentration higher than the analytical laboratory is capable of disposing of.

Based on previous data and the sparging impacts, the resulting waste is expected to comply with LDRs. Engineering Design File (EDF)-3077 (2005) contains additional background information on the treatment process.

The waste is radioactive, with an anticipated activity primarily attributed to cesium-137 and strontium-90. The work area is considered a radiation and/or contamination area; work will be conducted under a Radiological Work Permit (RWP).

Table 1-2. Major contaminants of concern in the consolidated waste.

Constituent	Mean Concentration (mg/kg)	90% UCL[a] Concentration (mg/kg)
Antimony	0.917	1.56
Arsenic	0.365	0.52
Barium	12.9	24.6
Beryllium	1.14	1.42
Cadmium	2.37	2.85
Chlorides	108	128
Chromium	299	384
Lead	37.0	43.6
Mercury	81.5	96.7
Nickel	16.9	20.9
Silver	19.2	20.4
Tetrachloroethylene (PCE)	118	176
1, 1, 1-Trichloroethane (TCA)	64.3	126
Trichloroethylene (TCE)	451	767
Bis-2-ethylhexyl phthalate (BEHP)	451	525
Aroclor-1260 (a PCB)	18.0	21.0
Toluene	6.49	16.6

Source: EDF-4928, “Potential Feed Streams for Inclusion into V-tank Treatment Process,” 2005.

a. UCL—upper confidence limit.

Table 1-3. Radionuclide content in the consolidated waste.

Radionuclide	Mean Concentration (nCi/g)	90% UCL [a] Concentration (mg/kg)
Cesium-137	992	1,180
Strontium-90	1,840	2,360
Transuranics	4.34	5.56

Source: EDF-4928, “Potential Feed Streams for Inclusion into V-tank Treatment Process,” 2005.

a. UCL—upper confidence limit.

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

ICP-MCP-9439 (2004) and the applicable QAPjP provide the description of the resources and resource responsibilities associated with environmental sampling activities. Table 2-1 contains specific personnel assignments and contact information not identified in QAPjP DOE-ID-10587 (DOE-ID 2004a).

Table 2-1. Proposed personnel and job assignments.[a]

Assignment	Name	Phone
TAN Completion Project ESH&QA Manager	Randy Sayer[b]	526-5706
Quality Assurance (QA)	Orin Marcum	526-1893
Radiation Engineering	Rick Sorensen	526-6944
Radiation Control Tech	Troy Terry	526-4039
Project Manager	James Jessmore	526-3033
Project Engineer	David Nickelson	526-5076
TAN Nuclear Facility Operations Manager	Al Millhouse[b]	526-6932
TAN V-Tanks Facility Manager	Jack Williams	526-6467
Operations Technical Lead/Field Team Leader	Bryan Crofts[b]	526-6366
Waste Generator Services (WGS) Facility Representative	Robert Lopez	526-8008
Packaging and Transportation Coordinator	Sheila Lints	526-6524
Sample and Analysis Management (SAM) Technical Representative	Tracy Elder[b]	526-2076
Environmental Services Project (ESP) Sampling Coordinator	Donna Copeland[b]	526-7050
Sampling Team Lead	Donna Copeland[b]	526-7050
Data Storage Administrator and Closure Report Generator	Donna Kirchner	526-9873

a. The facility will be responsible for the hazard evaluation review required by the work control, so a complete list of health and safety responsibilities is not included in this document.

b. ICP/EXT-04-00659 document reviewers. The project engineer identified additional document reviewers.

2.1 Environmental, Safety, Health, and Quality Assurance Support

Environmental, Safety, Health, and Quality Assurance (ESH&QA) personnel are assigned to the job site to provide resources and expertise to resolve ESH&QA issues. Since the facility is preparing the work control and HASP, the hazard review board will review those documents as part of the work control pre-job briefing.

2.2 TAN Completion Project Environmental Safety, Health, and Quality Assurance Manager

The TAN Completion Project (TCP) Environmental Safety, Health, and Quality Assurance (ESH&QA) manager or designee reports directly to the TCP director and is responsible for managing ESH&QA resources, including:

- Ensuring that ESH&QA programs, policies, standards, procedures, and mandatory requirements are planned, scheduled, implemented, and executed in the day-to-day TCP operations

- Directing ESH&QA compliance in all activities by coordinating related functional entities and providing technical and administrative direction to subordinate staff.

Under the direction of the TCP director, the TCP ESH&QA manager represents the TCP directorate in all ESH&QA matters and is responsible for:

- TCP ESH&QA management compliance

- Oversight for all TCP CERCLA operations planned and conducted at Waste Area Group 1

- TCP INEEL-wide environmental monitoring activities.

The TCP ESH&QA manager directs the management of personnel and the implementation of programs related to the following technical disciplines:

- Industrial safety
- Fire protection
- QA
- Industrial hygiene (IH) (matrixed)
- Emergency preparedness (matrixed)
- Radiation control
- Criticality safety (matrixed).

All ESH&QA activities associated with Phase 1 treatment sampling will be coordinated with the ESH&QA manager to make certain functional safety, quality, and environmental management are properly contacted per guidelines of the HASP.

2.3 Quality Assurance

Quality Assurance personnel will be responsible for reviewing both the health and safety documentation and this sampling plan to assess and ensure compliance with applicable INEEL procedures, including this document, at a Quality Level 4.

2.4 Radiation Engineering and Control

Because of the radioactive nature of the consolidated waste, all sampling activities (including waste packaging) will have to be under appropriate radiation controls. Primary responsibilities associated with Radiation Engineering and Control include the following:

- Assisting in design of the sampling station to ensure that the as low as reasonably achievable (ALARA) principles are being considered and that sampling personnel will not be exposed to radiation levels outside of administrative controls

- Monitoring the radiation levels and degree of sampling exposure experienced by sampling personnel during all phases of the sampling operation (sampling, sample storage, and sample packaging and transport)

- Monitoring the packaging of the sample containers to verify they are within P&T guidelines.

Radiation Engineering and Control will work with both the sampling team lead and the operations technical lead to ensure that the sampling operation will be conducted without spreading radioactive contamination and without exposing the sampling team to unnecessary radiation.

2.5 Project Manager/Facility Managers

The project manager (PM) and facility managers ensure that all activities conducted during the project comply with INEEL management control procedures, program requirements documents, and all applicable requirements of the Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), U.S. Department of Transportation (DOT), and the State of Idaho. The PM coordinates all document preparation, field and laboratory activities, data evaluation, risk assessment, dose assessment, and design activities. The PM is responsible for the overall work scope, schedule, and budget.

The PM is responsible for field activities and for all personnel (including craft personnel) assigned to work at the project location. The PM serves as the interface between operations and project personnel and works closely with the sampling team at the site to ensure that the objectives of the project are accomplished in a safe and efficient manner. The PM works with all other identified project personnel to accomplish day-to-day operations, identify and obtain additional resources needed at the site, and interact with ESH&QA oversight personnel on matters regarding health and safety.

The facility managers ensure that all work is performed in compliance with facility-specific requirements and that workers are aware of any health and safety hazards that may affect the job.

2.6 Project Engineer

The project engineer is ultimately responsible for all technical activities associated with Phase 1 design decisions on the consolidated V-tank waste. As such, he is responsible for making the major technical decisions associated with the V-tank sampling effort. Such decisions include determining whether the results of the air-sparged samples are sufficient to support the non-characteristic confirmation and F-listed treatment standards for the waste or if additional treatment activities are required. He is also available to confirm with the system engineer on determining when both air-sparging and tank cross-mixing activities can be considered complete prior to initiating Phase 1 treatment sampling activities. The project engineer will also be responsible for all other project decisions made as a result of this sampling activity.

2.7 Operations Technical Lead/Field Team Leader

The operations technical lead (OTL) or Field Team Leader (FTL) has ultimate responsibility for the safe and successful completion of activities associated with Phase 1 waste treatment activities (air-sparging and cross-mixing of the sparged tank wastes prior to sampling). This includes control of the Operating Area during Phase 1 treatment sampling operations. All health and safety issues at the V-tank site for this work must be brought to the OTL/FTL's attention. In addition to managing field operations, work control during Field Sampling Plan execution (as applicable), enforcing site control, documenting work site activities, and conducting daily safety briefings, the OTL/FTL's responsibilities include, but are not limited to the following:

- Enforcing task-site control, documenting activities, and conducting project-specific plan-of-the-day meetings and daily safety briefings at the start of each shift
- Completing briefings and reviews in accordance with MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews"
- Completing the job requirements checklist in accordance with Standard (STD)-101, "Integrated Work Control Process" and Work Order No. 89636
- Managing emergency and accident response and coordination
- Conducting ESH&QA inspections
- Ensuring compliance with waste management requirements and coordinating such activities with the environmental compliance coordinator or designee.

2.8 Waste Generator Services Facility Representative

The INEEL Waste Generator Services (WGS) facility representative will ensure disposition of waste material complies with approved INEEL waste management procedures. WGS personnel have the responsibility to help solve waste management issues at the task site. WGS personnel also prepare the appropriate documentation for waste disposal and make the required notifications. All wastes will be disposed of using approved INEEL procedures in accordance with INEEL MCP-3472, "Identification and Characterization of Environmentally Regulated Waste" (1999). The unaltered and altered samples will be reincorporated into the bulk V-tank wastes prior to stabilization.

2.9 Packaging and Transportation Coordinator

The Packaging and Transportation coordinator shall be responsible for ensuring that the collected samples are packaged and shipped to the appropriate analytical laboratory in accordance with DOT guidelines and for receiving sample media returned from the laboratory.

2.10 Sample and Analysis Management Technical Representative

The Sample and Analysis Management (SAM) technical representative is responsible to help define the analytical project, generate the sampling and analysis plan table, and generate and issue sample labels. The SAM representative determines which laboratory will provide analytical services based on established policies and contracts, and prepares the task order statement(s) (TOS). The SAM representative also tracks analytical progress and performs cursory review of the final data packages. The SAM representative will obtain independent validation of the data results as project requirements dictate.

2.11 Environmental Services Project Sampling Coordinator

The Environmental Services Project (ESP) sampling coordinator is responsible for coordinating sampling activities applicable to this project. Upon notification by the project manager, the sampling coordinator is responsible for obtaining and scheduling the necessary resources to complete the sampling task. The sampling coordinator will schedule sampling personnel to complete the task. The sampling coordinator is also responsible for managing and obtaining sampling supplies and tools to complete the task, if needed.

2.12 Sampling Team Lead

An ESP representative will be the sampling team lead for the sampling task and oversee sampling documentation and performance of the associated sampling activities. ESP sampling team lead activities usually include reviewing the request for sampling, walking down the job site, issuing a sampling plan, notifying the SAM to procure laboratories, ensuring that all required reviews and approvals are obtained on the sampling documentation, coordinating purchasing the equipment necessary to perform the job, and performing the pre-job briefing. ESP will maintain a project file until the project is complete and then turn it over to the data storage administrator.

2.13 Data Storage Administrator and Closure Report Generator

The data are tracked through the SAM. When data are received at the SAM, they are sent to ESP for interpretation and issuance of a closure report to the project manager. The data storage administrator is responsible for maintenance of data records. The final project file will be scanned into the Electronic Document Management System.

3. DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are qualitative and quantitative statements derived from the first six steps of the Environmental Protection Agency's (EPA's) DQO process (*Guidance for the Data Quality Objective Process* [EPA 2000]) and are summarized in the applicable project QAPjP referenced in Section 1 (*Quality Assurance Project Plan for Waste Groups 1,2,3,4,5,6,7,10 and Inactive Sites* [DOE-ID 2004a]).

3.1 Problem Statement

The first problem statement is to determine whether or not the previous non-characteristic designation for the consolidated V-tank waste was correct. This will be performed via toxicity characteristic leaching procedure-volatile organic compound (TCLP-VOC), TCLP-semivolatile organic compound (SVOC), and TCLP-metals analysis of samples of the sparged waste. Of particular emphasis is the need to verify the non-characteristic nature of eleven trace TCLP constituents (four VOCs and seven SVOCs). Air sparging is expected to eliminate most of the interferences in the samples that were causing detection levels that were higher than the regulatory levels. More sensitive analytical methods may be used to provide a conclusive determination for these eleven trace organic constituents, if necessary. Additional treatment conditions may also have to be performed (such as elevated temperature sparging/boiling or chemical oxidation) to remove additional contaminant interference sufficient to allow for a conclusive determination as to the non-characteristic or characteristic nature of these eleven trace organic constituents. This is in accordance with agreements by the agencies (DOE-ID, IDEQ, EPA Region 10) on how to proceed should inconclusive data still be generated. Additional treatment should only be performed after all other conditions have been attempted (including the use of more sensitive analytical methods).

The second problem statement is to determine if the air-sparging activity provides sufficient treatment of the organics to proceed toward direct solidification and disposal without additional treatment (i.e., elevated temperature sparging or chemical oxidation). This will be performed via total-VOC analysis on all F-listed contaminants of concern (all identified F001 constituents, plus toluene) in the sparged tank waste samples. The treated waste (if non-characteristically hazardous) must meet the F-listed treatment standards for these organics before it can be disposed of at the ICDF. However, the increase in weight associated with the addition of solidification agents (along with the resulting decrease in concentration associated with such a weight addition) can be considered in determining compliance to the F-listed treatment standards. Therefore, the resulting concentration of F-listed constituents in the air-sparged waste only has to be at a level low enough that the treatment standard for the F-listed constituents would be met following solidification.

The third problem statement is to determine the extent of treatment needed in Phase 2 treatment if the waste is characteristically hazardous or if sparging at ambient temperatures does not meet the F-listed treatment standards.

Any required verification sampling after characterization and stabilization will be performed under separate work control. The planning team and available resource members are identified in Section 2. The decision-maker for the activity is the project manager. Preliminary data from the air-sparge samples will be received three weeks after sample shipment. Validated analytical data will be received one week after the preliminary data has been received.

3.2 Decision Statement

The non-characteristic determination must be performed to complete Resource Conservation and Recovery Act/Toxic Substance Control Act (RCRA/TSCA) hazardous waste determination and to demonstrate that the V-tank waste meets or does not meet the ICDF Waste Acceptance Criteria (WAC). The leaching procedure shall be in accordance with standard TCLP methods (SW-846 [EPA 1986] Method 1831). The analyses will follow standard analytical procedures (SW-846 Method 8260B for VOCs, 8270C for SVOCs, 6010B for metals, and 7470A for mercury). Further Select Ion Monitoring (SIM) analysis (Section 7.5.12 of 8260B for VOCs, Section 7.5.5 of 8270C for SVOCs) will be performed on each prepared sample immediately following standard analyses, if necessary, to conclusively determine actual concentrations for the eleven trace organic D-list constituents identified in EDF-4885, as well as the eight F-listed organic contaminants needing to be treated prior to stabilization. If even higher resolution equipment is required, the analyses shall be performed using the same sample preparations that were previously prepared but will involve either the high-resolution gas chromatograph (GC)/low-resolution mass spectrometry (MS) equipment described in Method 8280 or the high-resolution GC/high-resolution MS equipment described in Method 8290 for those trace organic constituents still inconclusive following SIM analysis. No additional sample volume will be taken for the higher resolution analytical methods since the sample preparation will be the same for all analyses and the analyses only use a small portion of the prepared sample volume.

The objective(s) of this non-characteristic determination effort is to answer the following question:

- Does the consolidated TAN V-tank waste contain hazardous concentrations of TCLP-metals, TCLP-VOCs, or TCLP-SVOCs, with particular emphasis on the eleven trace RCRA constituents identified in EDF-4885 (2004)? The eleven trace RCRA constituents of concern (COC), their D-codes, and release limits are shown in Table 3-1.

Table 3-1. Contaminants of concern, D-codes, and regulatory limits.

TCLP Contaminant of Concern	D-Code	Regulatory Limit
1,2-Dichloroethane	D028	0.5 mg/L
Benzene	D018	0.5 mg/L
1,1-Dichloroethylene	D029	0.7 mg/L
2,4-Dinitrotoluene	D030	0.13 mg/L
Hexachlorobenzene	D032	0.13 mg/L
Hexachlorobutadiene	D033	0.5 mg/L
Hexachloroethane	D034	3.0 mg/L
Nitrobenzene	D036	2.0 mg/L
Pyridine	D038	5.0 mg/L
2,4,6-Trichlorophenol	D042	2.0 mg/L
Vinyl chloride	D043	0.2 mg/L

The alternate actions (AAs) to be taken, depending on the resolution of the principal study question(s) (PSQ)(s), are as follows:

- If the materials are determined to be non-characteristic (they can be TSCA hazardous or radioactive), they may be disposed of at the ICDF after solidification provided they meet F-listed treatment standards for all F001 constituents and toluene following solidification.

- If they are determined to be characteristic, the waste must be treated to meet both F-listed treatment standards, as well as underlying hazardous constituent (UHC) Universal Treatment Standards (UTSs) and will require chemical oxidation as part of Phase 2 treatment to meet the ICDF disposal requirements. This Field Sampling Plan does not address Phase 2 activities.

- If sample results show that the waste is non-characteristic but that sparging in combination with solidification does not meet the F-listed treatment standards, then the waste must undergo Phase 2 treatment to meet ICDF disposal requirements. However, UHC UTSs do not need to be met by Phase 2 treatment under this condition. This Field Sampling Plan does not address Phase 2 activities.

Process requirements associated with these objectives are as follows:

- Mix waste in consolidation tanks sufficiently to produce representative samples from single sample location (see EDF-6584).

- Ensure appropriate analytical methods (with high resolution equipment as necessary) are used for the eleven targeted trace organic contaminants of concern (see Table 3-1) such that detection limits are sufficiently below regulatory levels, such that a 90% UCL estimate, using detection levels as actual leachate concentrations, would still be below the regulatory levels for each constituent of concern. This will prevent inconclusive results that limit the project's ability to defensively determine when treatment is complete and the waste is acceptable for disposal.

- If lab-scale elevated temperature sparging/boiling or chemical oxidation activities are performed as part of the determination of the extent of Phase 2 treatment, they should be performed under conditions expected to represent actual Phase 2 conditions.

Combining the PSQ and AAs results in the following decision statements:

- Does the consolidated V-tank waste pass TCLP for all D-listed VOCs, SVOCs, and metals (with particular emphasis on the eleven trace D-list constituents discussed in Decision Statement 1)? (see Figure 1-1.)

- Does air-sparging of the consolidated V-tank waste result in organic concentrations in the waste that meet nonwastewater treatment standards for the eight F-listed constituents listed in Table 3-2 following waste solidification? (see Figure 1-2.)

- If sparging at ambient temperatures is insufficient to meet F-listed treatment standards, what is the extent of Phase 2 treatment necessary to meet LDR treatment standards and ICDF WAC?

Table 3-2. F-listed constituents of concern and their treatment standards.

F-Listed Constituent	Treatment Standard
Tetrachloroethylene (PCE)	6.0 mg/kg
Trichloroethylene (TCE)	6.0 mg/kg
Methylene chloride	30 mg/kg
1,1,1-Trichloroethane (TCA)	6.0 mg/kg
Carbon tetrachloride	6.0 mg/kg
1,1,2-Trichloro-1,2,2-trifluoromethane (CFC-113)	30 mg/kg
Trichloromonofluoromethane (CFC-11)	30 mg/kg
Toluene	10 mg/kg

3.3 Decision Inputs

To resolve the decision statements, concentrations of the constituents of concern must be obtained using approved analytical methods. The constituents of concern in the V-tank waste include:

- Analyses of TCLP leachates for all D-listed metals, VOCs, and SVOCs, using standard analytical methods

- SIM-analyzed TCLP leachates for four RCRA volatile organic compounds and seven RCRA semivolatile organic compounds, if necessary (with even more sensitive analytical methods, if necessary)

- Total concentrations of F-listed constituents in the waste (using SIM analysis or even more sensitive analytical methods, if necessary).

The project reviewed past data and necessary detection limits to select the contaminants of concern and associated analytical methods for this sampling investigation (Section 3.2).

3.4 Study Boundaries

The spatial boundary of the study is a well mixed consolidated waste stream of 16,000 gal, contained within three 8,000-gallon tanks. Access to recirculated liquids will be from a single low-point drain valve located in the recirculation lines between the cross-mixed tanks. The valve, including control of the flow rate, will be tested prior to sampling. There is no reason to believe that the valve will physically limit access to the waste. The valve will be purged prior to sample collection to remove any stagnant material. Premixing between sparged tanks prior to sampling and continuous cross-mixing during sampling is required to ensure representative samples from the single sample valve.

Plans are to mix the three tanks concurrently. Calculations performed in support of this operation (see EDF-6584) have determined that a mixing time of at least 8 hours is recommended and 6 hours is required, before consolidated waste sampling can proceed. The calculation is based on assumptions that the maximum volume of waste in each consolidation tank is 5,333 gal and that the rate of mixing between tanks is 60 gal/min. The results from the calculation suggest that the concentrations in each of these tanks, after 8 hours of mixing, will differ by approximately 0.1%, while the concentrations in each of these tanks, after 6 hrs of mixing, will differ by less than 1% (see EDF-6584).

The temporal boundaries of the study are the target dates defined in Section 3.1.

Limitations on data interpretation introduced by sample collection constraints, if applicable, will be brought immediately to the project manager's attention and discussed in the project final report.

3.5 Decision Rule

If the waste is non-characteristic and F-listed treatment standards have been met after sparging, the waste can be solidified and disposed of at the ICDF without additional Phase 2 treatment.

If the waste is non-characteristic and F-listed treatment standards have not been met after sparging, lab-scale elevated temperature sparging will be conducted to determine the extent of Phase 2 treatment necessary.[a]

If the TCLP leachate concentrations of RCRA volatile organic analyses (VOAs) and semivolatile organic analysis (SVOAs) exceed characteristic levels, then chemical oxidation will be required for Phase 2 treatment.[a]

Figure 3-1 is a flow diagram showing the decisions to be made by the Phase 1 treatment sampling activity.

3.6 Decision Error Limits

Two types of decision errors have been identified in this sampling design. The first is that the analyzed waste may be determined to **not** contain hazardous constituents above regulatory limits, when in fact, they **do**, and the second is that the waste may be determined to contain hazardous constituents above regulatory limits, when, in fact, they **do not.** The consequences of each decision error are discussed below.

Determining that the consolidated waste stream is not RCRA characteristic or does meet the treatment standard, when in fact, the waste is RCRA characteristic or fails to meet the treatment standard, would result in the consolidated waste stream not receiving appropriate treatment. This may result in CERCLA compliance issues and failure to protect human health and the environment. This wrong decision is generally referred to as a Type I error or a false positive error.

Determining that the consolidated waste stream is RCRA characteristic or does not meet the treatment standard, when in fact, the waste is not RCRA characteristic or meets the treatment standard, would result in further expense of project resources to complete unnecessary activities (i.e., Phase 2 treatment). This wrong decision is generally referred to as a Type II error or a false negative error.

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a. Phase 2 treatment will be described in Addendum 3 of the RD/RA Work Plan (DOE, EPA, IDEQ 2004), as necessary.

The Field Sampling Plan recommends a minimum confidence level of 90% for Type I errors (false-positive), and the minimum complement of the power is 80% for the Type II errors (false negative). The 90% level was established based upon EPA in SW-846 guidance for determining compliance with concentration-based requirements.

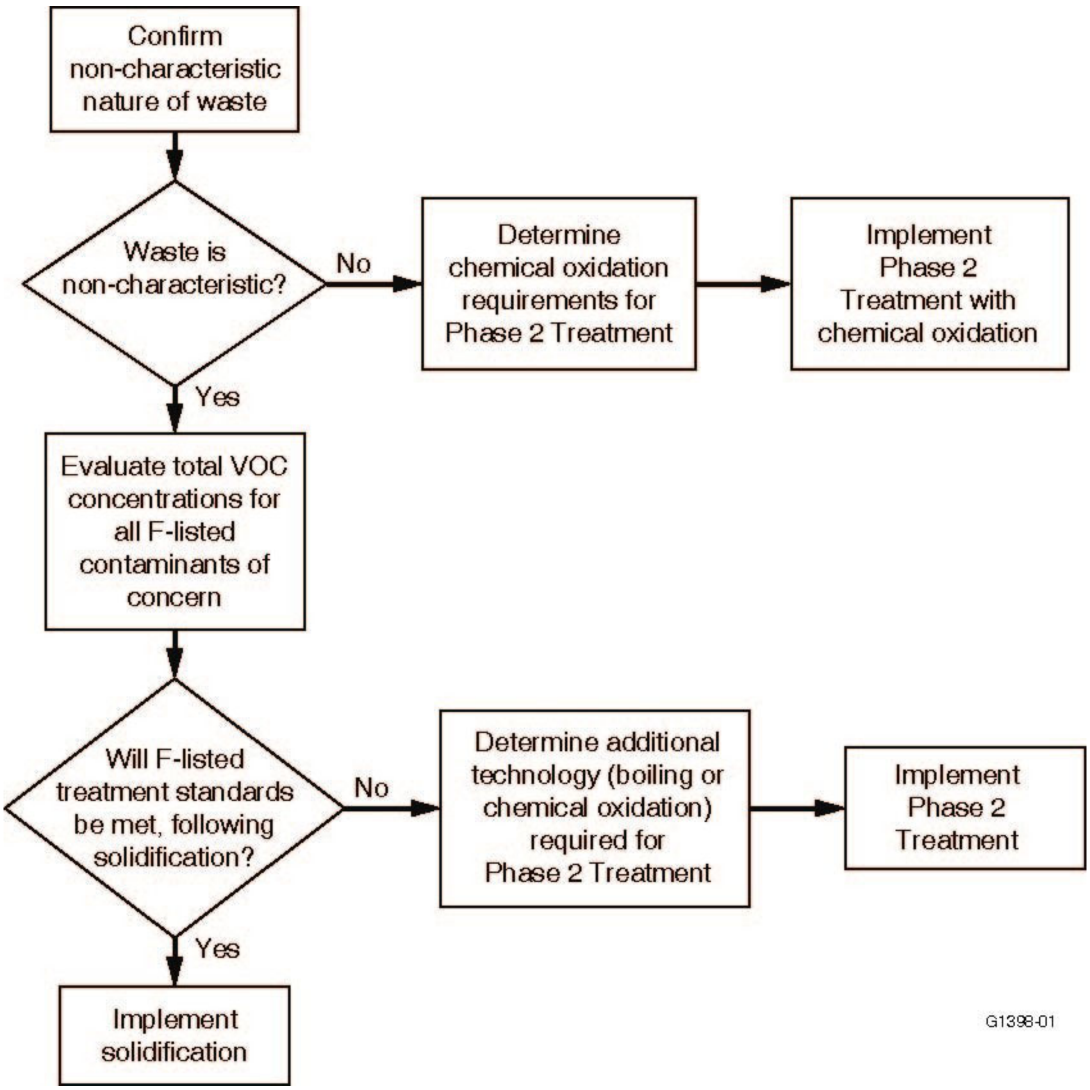

Figure 3-1. Flow diagram for the Phase 1 treatment sampling decisions.

3.7 Design Optimization

The sample design chosen for the TAN V-tanks' waste is based on the approach designed to provide representative data. Samples that are representative of the material being characterized will be obtained by collecting grab samples off a valve. However, the design and presampling process used to homogenize all tank contents (i.e., 6-8 hrs of cross-mixing between tanks, following air-sparging) results in inherently composited samples. Refer to EDF-6584, which shows the project's calculations for required mixing time for optimum sample representativeness. In addition, procedures will be in place (via work packages) to flush the potential "dead space" portions of the recirculatory line (where premixing may not have had any effect) prior to initiating sampling and following each sample set. Finally, the Phase 1 treatment sampling will be conducted with the air-sparging activity temporarily discontinued to eliminate concerns associated with the randomness of the sample data (due to continually lower concentrations of VOCs if air-sparging were to continue and the time between sample collections were accidentally prolonged).

The sample sets will be collected sequentially, with no expected downtime between sets, with the exception of shutting off the valve between samples and flushing the sample line between sample sets. After any unforeseen downtime (such as for sample equipment maintenance or transporting the sample bottles out of the containment area) and before resuming sampling, the sample line will be flushed.

4. SAMPLE COLLECTION, ANALYSIS, AND DATA MANAGEMENT

4.1 Sample Collection

4.1.1 Pre-Sampling Meeting

Before the start of each field-sampling project, ESP-assigned sampling resources prepare for the sampling activity in accordance with MCP-1394, "Managing Hazardous Samples" (2005), and participate in applicable pre-job briefings conducted in accordance with MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback" (2005). Personnel at the meeting will ensure that all necessary equipment and documentation are present and that all personnel understand the project scope and objectives.

4.1.2 Sampling and Analysis Requirements

Radiological engineering will determine how the sample valve access will be controlled and how sample material will be contained to prevent contamination spread to the surrounding environment. The specifics regarding the health and safety aspects of sampling will be covered under facility work control (in accordance with the HASP). Project personnel have determined that a suite of samples for the contaminants of concern will be collected in triplicate, and trip blanks of water will also be sent to evaluate VOC cross contamination between samples. Such sampling is sufficient to provide a 90% confidence level for the resulting data. Replicate samples are taken to show data comparability, while trip blanks are collected to show any interference introduced during transport. The same level of triplicate analysis will also be provided for each type of analysis that is undertaken (if more sensitive analytical methods are required), as well as for each additional treatment condition (i.e., boiling or chemical oxidation) that must be performed (if additional treatment conditions are required).

Only four types of analyses are required for Phase 1 treatment sampling activities:

- TCLP-VOAs
- TCLP-SVOAs
- TCLP-metals
- Total VOAs.

The TCLP-VOA, TCLP-SVOA, and TCLP-metals analyses are needed to confirm the non-characteristic designation of the consolidated waste stream, while the total VOA analysis is needed to determine if air-sparging treats the consolidated waste sufficiently that all applicable F-listed treatment standards can be met by simply stabilizing the waste, without additional pretreatment such as chemical oxidation. If results from the air-sparge samples show that treatment standards cannot be met by air-sparging and solidification or if the waste is found to be characteristically hazardous, then additional analyses will be performed following elevated temperature sparging/boiling and/or chemical oxidation of the laboratory samples to determine the degree of Phase 2 treatment that will be required.

The agencies (DOE-ID, IDEQ, EPA Region 10) identified the degree of PCB volatilization during treatment as a concern that still must be addressed during V-tank remediation. The best method to address PCB volatilization is to evaluate the concentration of PCBs in the granular activated carbon (GAC) filter as part of the secondary waste disposition following treatment. Such analysis will be requested of Waste Generator Services at the time of secondary waste disposition.

The SAM representative is responsible for coordinating sampling activities with the laboratory and preparing a sampling and analysis plan table (Appendix A), field guidance forms, and the associated sample labels. The laboratory is aware of the anticipated levels of activity and has specified minimum sample volumes (see Table 4-1) to be submitted for analysis to ensure compliance with their Nuclear Regulatory Commission (NRC) license and other regulatory drivers.

The complex sampling strategy is due to additional analyses that may be required if the initial non-characteristic confirmation is inconclusive or the F-listed treatment standards have not been met by air-sparging. If the initial non-characteristic confirmation is inconclusive, the samples must be subjected to additional pretreatment options to try to remove the interferences from the waste prior to re-analysis. Such additional pretreatment options include both elevated temperature sparging/boiling and oxidation. It is recognized that such additional treatment activities may also be removing the trace contaminants from the waste. For this reason, the additional treatment activities associated with the non-characteristic confirmation should only be performed after all attempts have been made to obtain conclusive results in the initial analysis. For this reason, the most sensitive types of organic analyses should be used on the targeted organic constituents identified in Tables 3-1 and 3-2, if appropriate (see Section 3.2 for details). Additional sample material will be needed if such measures produce inconclusive results. If the results from Phase 1 treatment show that air-sparging did not reduce F-listed constituents to less than treatment standards (following solidification), then additional sample material will be used in lab-scale studies to define the extent of Phase 2 treatment that will be required. All analyses, except for TCLP-metals, have the potential of being performed under boiling and/or chemical oxidation conditions, in addition to the air-sparged condition.

For this reason, the volume and amount of sample material needed for triplicate analysis of TCLP-metals, TCLP-VOAs, TCLP-SVOAs, and total VOAs were carefully identified and documented in Table 4-1. The documentation is performed by determining the minimum amount of sample material required for each analysis and multiplying it by the number of conditions or analyses that may need to be performed. Included in each determination are any special considerations that might be required, such as the need for matrix spikes and matrix spike duplicates, the identification of triplicate volumes for at least one of the triplicate analyses per condition, and potential issues associated with providing additional samples if sample bottles break. In addition, the sample determination must be made while limiting the maximum volume of each sample to less than 1 L total volume (because of container limitations).

Table 4-2 summarizes the number of sample bottles required for this sampling activity, as well as the volume of each sample bottle, and the minimum filling requirement for each sample. As shown in Table 4-2, a total of seven 1-L sample bottles, five 500-mL sample bottles, two 250-mL sample bottles, six 125-mL sample bottles, and six 40-mL sample bottles are required for the Phase 1 sampling activity. The six 40-ml samples include four trip blank samples and two samples that are to be used in the actual evaluation. The sample bottles are to be filled to approximately 90% of their capacity (except for four of the 40-mL sample bottles, which will serve as trip blank samples, and will be filled to capacity [zero head-space] with water). Table 4-1 specifies the type of analysis and condition represented by each sample bottle. Table 4-3 lists the sample identification numbers.

All samples will be collected from a single sample port located in the recirculation lines between the cross-mixed tanks. Sampling should not be performed until after 42-hr of air-sparging has been performed on each tank or the system engineer has determined that air-sparging is complete based on periodic off-gas monitoring results. In addition, sampling should not be performed until the tanks have been adequately mixed (see Section 3.4). Prior to starting sampling operations, air-sparging must be discontinued. This is necessary to keep the air-sparging activity from continuing to remove volatile

Table 4-1. Consolidated tank waste sample breakdown.

Sample ID	Sample Containers in Set	Sample Type[a,b]	Analyses[a,b]	Minimum Required Sample Volume	Minimum Total Sample Volume	Volume of Sample in Container (80-90%)	Container Volume
VTK004-1st Sample Set	1	Total VOA-A-1 (as-received)	VOA-A-1 VOA-A-MS VOA-A-MSD	5 mL 5 mL 5 mL	15 mL		
		Total VOA-B-1 (after boiling)	VOA-B-1 VOA-B-MS VOA-B-MSD	5 mL 5 mL 5 mL	15 mL		
		Total VOA-C-1 (after chem. ox.)	VOA-C-1 VOA-C-MS VOA-C-MSD	5 mL 5 mL 5 mL	15 mL		
		Total Container 1			**45 mL**	**100 mL**	**125 mL**
	2	TCLP VOA-A-1 (as-received)	TCLP-VOA-A-1 TCLP-VOA-A-MS TCLP-VOA-A-MSD	25 mL 2 5 mL 25 mL	75 mL		
		TCLP VOA-B-1 (after boiling)	TCLP-VOA-B-1 TCLP-VOA-B-MS TCLP-VOA-B-MSD	25 mL 25 mL 25 mL	75 mL		
		TCLP VOA-C-1 (after chem. ox.)	TCLP-VOA-C-1 TCLP-VOA-C-MS TCLP-VOA-C-MSD	25 mL 25 mL 25 mL	75 mL		
		Total Container 2			**225 mL**	**225 mL**	**250 mL**
	3	TCLP-MTL-A-1	TCLP-MTL-A-1	110 mL	330 mL		
		(as received)	TCLP-MTL-A-MS	110 mL			
			TCLP-MTL-A-MSD	110 mL			
		Total Container 3			**330 mL**	**400 mL**	**500 mL**
	4	TCLP SVOA-A-1 (as-received)	TCLP-SVOA-A-1	430 mL	430 mL		
		TCLP SVOA-B-1 (after boiling)	TCLP-SVOA-B-1	430 mL	430 mL		
		Total Container 4			**860 mL**	**900 mL**	**1,000 mL**
	5	TCLP SVOA-A (as-received)	TCLP-SVOA-A-MS TCLP-SVOA-A-MSD	430 mL 430 mL	860 mL		
		Total Container 5			**860 mL**	**900 mL**	**1,000 mL**
	6	TCLP SVOA-B (after boiling)	TCLP-SVOA-B-MS TCLP-SVOA-B-MSD	430 mL 430 mL	860 mL		
		Total Container 6			**860 mL**	**900 mL**	**1,000 mL**
	7	TCLP SVOA-C-1 (after chem. ox.)	TCLP-SVOA-C-1	430 mL	430 mL		
		Total Container 7			**430 mL**	**450 mL**	**500 mL**
	8	TCLP SVOA-C (after chem. ox.)	TCLP-SVOA-C-MS TCLP-SVOA-C-MSD	430 mL 430 mL	860 mL		
		Total Container 8			**860 mL**	**900 mL**	**1,000 mL**
VTK005-2nd Sample Set	9	Total VOA-A-2 (as-received)	VOA-A-2	5 mL	5 mL		
		Total VOA-B-2 (after boiling)	VOA-B-2	5 mL	5 mL		
		Total VOA-C-2 (after chem. ox.)	VOA-C-2	5 mL	5 mL		
		Total Container 9			**15 mL**	**35 mL**	**40 mL**

Table 4-1. (continued).

Sample ID	Sample Containers in Set	Sample Type[a,b]	Analyses[a,b]	Minimum Required Sample Volume	Minimum Total Sample Volume	Volume of Sample in Container (80-90%)	Container Volume
	10	TCLP VOA-A-2 (as-received)	TCLP-VOA-A-2	25 mL	25 mL		
		TCLP VOA-B-2 (after boiling)	TCLP-VOA-B-2	25 mL	25 mL		
		TCLP VOA-C-2 (after chem. ox.)	TCLP-VOA-C-2	25 mL	25 mL		
		Total Container 10			**75 mL**	**100 mL**	**125 mL**
	11	TCLP MTL-A-2 (as received)	TCLP-MTL-A-2	110 mL	110 mL		
		Total Container 11			**110 mL**	**110 mL**	**125 mL**
	12	TCLP SVOA-A-2 (as-received)	TCLP-SVOA-A-2	430 mL	430 Ml		
		TCLP SVOA-B-2 (after boiling)	TCLP-SVOA-B-2	430 mL	430 mL		
		Total Container 12			**860 mL**	**900 mL**	**1,000 mL**
	13	TCLP SVOA-C-2 (after chem. ox.)	TCLP-SVOA-C-2	430 mL	430 mL		
		Total Container 13			**430 mL**	**450 mL**	**500 mL**
VTK006-3rd Sample Set	14	Total VOA-A-3 (as-received)	VOA-A-3	5 mL	5 mL		
		Total VOA-B-3 (after boiling)	VOA-B-3	5 mL	5 mL		
		Total VOA-C-3 (after chem. ox.)	VOA-C-3	5 mL	5 mL		
		Total Container 14			**15 mL**	**35 mL**	**40 mL**
	15	TCLP VOA-A-3 (as-received)	TCLP-VOA-A-3	25 mL	25 mL		
		TCLP VOA-B-3 (after boiling)	TCLP-VOA-B-3	25 mL	25 mL		
		TCLP VOA-C-3 (after chem. ox.)	TCLP-VOA-C-3	25 mL	25 mL		
		Total Container 15			**75 mL**	**100 mL**	**125 mL**
	16	TCLP MTL-A-3 (as received)	TCLP-MTL-A-3	110 mL	110 mL		
		Total Container 16			**110 mL**	**110 mL**	**125 mL**
	17	TCLP SVOA-A-3 (as-received)	TCLP-SVOA-A-3	430 mL	430 mL		
		TCLP SVOA-B-3 (after boiling)	TCLP-SVOA-B-3	430 mL	430 mL		
		Total Container 17			**860 mL**	**900 mL**	**1,000 mL**
	18	TCLP SVOA-C-3 (after chem. ox.)	TCLP-SVOA-C-3	430 mL	430 mL		

Table 4-1. (continued).

Sample ID	Sample Containers in Set	Sample Type[a,b]	Analyses[a,b]	Minimum Required Sample Volume	Minimum Total Sample Volume	Volume of Sample in Container (80-90%)	Container Volume
		Total Container 18			**430 mL**	**450 mL**	**500 mL**
Reserve samples	19 (reserve volume)	Total VOA-Reserve Samples					
		Total Container 19				**100 mL**	**125 mL**
	20 (reserve volume)	TCLP VOA-Reserve Samples					
		Total Container 20				**225 mL**	**250 mL**
	21 (reserve volume)	TCLP-MTL-Reserve Samples					
		Total Container 21				**400 mL**	**500 mL**
	22 (reserve volume)	TCLP SVOA-A-Reserve Samples					
		Total Container 22				**900 mL**	**1,000 mL**
VTK007 – trip blank	23	**Total VOA-T-1**	**VOA-T-1**	**40-mL bottle with no headspace, H2S04 to pH<2**	**40 mL**	**40 mL**	**40 mL**
	24	**Total VOA-T-2**	**VOA-T-2**	**40-mL bottle with no headspace; H2S04 to pH<2**	**40 mL**	**40 mL**	**40 mL**
	25	**TCLP VOA-T-1**	**TCLP-VOA-T-1**	**40-mL bottle with no headspace; H2S04 to pH<2**	**40 mL**	**40 mL**	**40 mL**
	26	**TCLP VOA-T-2**	**TCLP-VOA-T-2**	**40-mL bottle with no headspace; H2S04 to pH<2**	**40 mL**	**40 mL**	**40 mL**

a. Lettering nomenclature: A—as received by lab (after air-sparging); B—after boiling by lab; C—after chemical oxidation by lab.

b. Numbering nomenclature: 1—VTK004 - 1st sample set; 2—VTK005 - 2nd sample set; 3—VTK006 - 3rd sample set; 5—VTK007 - trip blank sets. No identifier for reserve set.

Table 4-2. Sample container volume summary.

Number of Containers	Size of Container	Sample Volume	Total Sample Volume
4	40 mL	40 mL (zero headspace)	160 mL
2	40 mL	35 mL	70 mL
6	125 mL	110 mL	660 mL
2	250 mL	225 mL	450 mL
5	500 mL	450 mL	2,250 mL
7	1,000 mL	900 mL	6,300 mL
26 Total Containers			9,890 mL Total Volume

Table 4-3. Sample container identification summary.

Size of Container	Sample ID VTK004	VTK005	VTK006	Reserve Samples	VTK007
40 mL	0	1	1	0	4
125 mL	1	2	2	1	0
250 mL	1	0	0	1	0
500 mL	2	1	1	1	0
1,000 mL	4	1	1	1	0
Containers per Sample	8	5	5	4	4

organics from the waste during sampling, which could bias the random variability of the samples. The sample sets are to be collected in the order shown in Table 4-1, and the sampling line will be flushed before each sample set interval (the first, second and third sample sets, and the reserve sample set).[b] Detailed instructions to the laboratory on how to process the samples are provided in the project-specific task order statement (TOS) provided by the SAM point of contact.

The sample bottles will be positioned in a containment structure and placed in secondary containment while filling. Wipes or other absorbent in the bottom of the secondary containment will be used to absorb any drips/spills. Sudden discharges from the sample port will be minimized by using a fill reservoir on the sample port downstream of the recirculation pump (although the peristaltic return pump that is to be attached to a designated sample drain valve upstream of the recirculation pump can be used as a backup). The specifics as to how samples will be collected and material controlled will be covered in facility work control, which is being prepared concurrently with this sampling plan. The waste will be drained directly from the valve to the bottles with no other associated apparatus. A funnel may be used to facilitate transfer, if necessary.

Per SW-846 (EPA 1986), this waste is classified as a "concentrated" waste. This designation as a concentrated waste eliminates the need to preserve VOA or metals samples to a pH less than 2.

The shortest maximum sample holding time for the various analyses is 14 days from the time of sample collection to that for analysis (for the total-VOC and TCLP-VOC analyses), with 7 days for the TCLP extraction portion of the analysis on both the VOC and SVOC samples. The holding time period for laboratory treatment samples is initiated upon completion of lab-scale treatment. What this means is that while a 14-day holding time immediately applies to the air-sparged samples, upon sample receipt, the holding times for the elevated temperature sparged/boiled sample material or chemically oxidized sample material do not apply until after elevated temperature sparging/boiling or chemical oxidation has been performed. Samplers and the SAM will coordinate with the analytical laboratory to ensure that samples either arrive at the laboratory or are analyzed following additional treatment in a manner that meets holding times. Applicable preservation requirements for each sample include preserving the samples at 4±2°C, with the addition of chemical preservation for trip blanks as discussed above. A schedule of 14 days (from sample collection) for faxed sample results for all analyses will guarantee that all sample holding times are met.

b. The four trip blank samples listed last in Table 4-1 are prepared prior to sample collection to accompany real samples through sampling and packaging process. Each shipping container will have a total VOA trip blank and a TCLP-VOA trip blank included in it.

Compliance with Department of Transportation regulations, which prohibit the complete filling of bottles containing hazardous/radioactive liquids [49 CFR 173.24 (h) and 49 CFR 173.24a (d)], results in a potential data quality impact to the analysis of VOCs (both total VOCs and TCLP-VOCs). The lack of zero headspace for the total VOA and TCLP-VOA samples directly deviates from typical sample protocol. As a result of the sample protocol deviation, it is expected that the validator would give a qualification flag to sample results for VOAs unless specific arrangements are communicated to the validator. Such a flag should not impact final acceptance of the results by the agencies (DOE-ID, IDEQ, EPA Region 10) because the samples are taken from an open air system that is continuously recirculated following sampling and has already undergone at least 42 hr of 40 cfm air-sparging on each tank volume prior to sampling. In addition, the consolidated waste tanks will continue to be sparged following sampling. Calculations indicate that the amount of air coming in contact with the waste post-sampling is at least 400 times that experienced by the sealed sample bottles as they await sampling. Therefore, the samples with non-zero headspace should still be a conservative approximation of the actual condition within the V-tank waste.

As shown in Table 4-1, additional sample bottles will be collected and used in the event extra volume is needed.. The additional sample volume will be representative of the maximum sample volume for a particular analysis (125 mL for total VOAs, 250 mL for TCLP-VOAs, and 1,000 mL for TCLP-SVOAs), with one additional sample taken for each analysis type. If for some reason more than one container is broken or a sample is in some way unusable, additional sample material from later conditions (boiling or chemical oxidation) can be used. The consolidated waste should be resampled only if all existing sample material sent to the analytical laboratory has been exhausted. Therefore, additional sampling should only occur when both the sample material is lost and when added conditions for sample evaluation, beyond that of air-sparging, are required. The PM is responsible to ensure that a Document Action Request (DAR) is written and approved for any presampling changes to this characterization plan.

Sampling logbook(s) will be maintained in accordance with MCP-9227, "Environmental Services Project Logkeeping Practices" (2004).

All the particulars related to the laboratory's handling of wastes, including the conditions for lab-scale elevated temperature sparging/boiling or lab-scale chemical oxidation, will be addressed in the project-specific contracts that the SAM will prepare.

4.1.3 Sampling Equipment and Documentation

Sampling equipment, documentation, and any other supplies that will be used for sampling are identified in MCP-9227 (2004) and MCP-1394 (2005). The following specific items or appropriate substitutes are required for this sampling activity:

- Bottles (including extras in the event of breakage)
- Funnel, if needed
- Secondary containment may be required—facility to direct
- Sample decontamination materials
- Lead shielding may be required—Radiological Control to direct
- Peristaltic sample return pump with a quick disconnect line for connection to the return interface drain valve (to be used for sample residue returns and a backup for the existing sampling port)

- Backup line for the peristaltic pump system
- Personal protective equipment (PPE) designated in the work control to be provided by the facility and any applicable RWP
- Chain of Custody forms
- Field guidance forms/labels/waterproof pens
- Logbook
- Wipes/absorbent towels
- Laboratory Task Order Statement
- Final plan
- Source term information provided by project
- Forms required under MCP-1394 for radiological shipment
- Packaging required by Packaging and Transportation (P&T)—expected to be drums—and all required components of packaging
- Adhesive tape (clear, duct, and strapping), shipping labels, parafilm
- Liner bags, individual sample bags
- Custody seals.

4.1.4 Field Equipment Calibration and Set-Up

The industrial hygienist (IH) is responsible for the measurement and evaluation of any personnel exposure chemical hazards. All IH instrumentation calibrations are performed per Guide (GDE)-196, "Industrial Hygiene Sampling Guide" (2003). If IH monitoring is required, it will be addressed in the facility work control.

The radiological control technician (RCT) is responsible for measurement and evaluation of personnel and material radiological contamination. RCT instrumentation calibrations are performed per procedures in Company Manual 15D.

4.1.5 Sample Designation and Labeling

Each sample bottle will contain a label identifying the unique field sample number. Uniqueness is required for maintaining consistency and preventing the same identification code from being assigned to more than one sample. A systematic character code will be used to uniquely identify all samples. The SAM will generate a sampling table, numbers, and labels that correlate directly to characterization sampling (refer to Appendix A). The information on the label and label placement are as provided in MCP-1394.

4.1.6 Chain of Custody

All samples collected will be managed via chain of custody in accordance with MCP-1394.

4.1.7 Sampling Design and Procedures

Four sample sets (three samples per analysis, plus a fourth "reserve" sample set) will be taken in sequence from the valve following complete sparging and recirculation activities. The material is primarily liquid, but also includes sludge, which will settle out after collection. The media is described as a waste that represents the material from the V-1, V-2, V-3, and V-9 tank contents (and four other minor volume waste streams). The required analyses and sample container volumes are listed in Table 4-1. Specific sample identifiers are listed in the Sampling and Analysis Plan table in Appendix A. Instructions for collecting waste samples from the valve are provided in the following subsection.

4.1.7.1 V-Tank Waste Sampling

1. Review the sample plan and all facility work control documentation.

2. Ensure that all training is current.

3. Ensure that all required equipment is available and staged for use.

4. Ensure that all preliminary paperwork has been completed—source term, MCP-1394 forms required for certification of shipping containers, and request for P&T assistance.

5. Ensure that the sampling is on the plan of the day, a RWP is in place, and RCT support is available.

6. Ensure that all support personnel critical to completing sample collection, packaging, and shipment are available.

7. Ensure that trip blanks have been prepared/provided.

8. Pre-mark all sample bottles (except the trip blanks) to 90% of full volume. The specific volumes and construction types of bottles designated in Table 4-1 must be used for all sample collection activities.

9. Verify with the system engineer that both consolidation tank volumes have been adequately air-sparged, that cross-mixing of tank volumes is underway at a rate of at least 50 gal/min, that cross-mixing has been performed for at least 6 hr (8 hr preferable), and that cross-mixing operations will continue during sampling. Document in the logbook.

10. Hold a documented pre-job briefing in accordance with MCP-3003.

11. Discontinue air-sparging activities on the cross-mixing tanks.

12. Don required PPE as specified in the work control and RWP.

13. Attach the peristaltic return pump to the sample return interface valve located in the recirculation lines between the cross-mixed tanks.

14. Stage secondary containment and a container for flushing the sample system, and place absorbent material in the bottom of the containment (unless this step has already been completed by Facility Operations or other).

15. Open the sample valve(s).

16. Proceed to flush the sample system into the secondary container(s) under direction of the system engineer.

17. Stage prelabeled bottles in vicinity of the sample system (unless this action has already been completed during site preparation activities). The samples shall be collected in the order shown in Table 4-1.

18. Slowly manipulate the sample system to avoid splashing and to control flow, allowing the waste to flow gently (with minimal entry disturbance) into the bottles. Fill to 90% of bottle capacity, then close the valve. If necessary, use a funnel to facilitate transfer.

NOTE: *The sample system will need to be closed between each sample. Bottles will be wiped thoroughly in the event of any residual sample external contamination. There is no need to check the pH. The pH is known to be 6–8.*

19. Tightly seal the sample container lid by hand. Note that parafilm is not required for VOCs, and handling of bottles must be minimized as much as possible due to as low as reasonably achievable (ALARA) concerns.

20. Flush the sample line between each sample set per steps 14 and 15.

21. Close sample valve(s) when sample operations are discontinued.

22. Package each sample bottle in compliance with MCP-1394 and P&T instruction. Remove the collected samples from the glovebox, and place them in a sample refrigerator for at least 12 hours prior to packaging and shipment (to allow for sample settling).

23. Return the collected flush liquid (from Step 16) to the consolidated waste volume using the peristaltic return pump system.

24. Turn off the peristaltic pump.

25. Resume air-sparging activities on the consolidation tanks (while continuing the cross-mixing). The air-sparging shall be at a total rate of at least 40 cfm in the consolidation tanks.

26. Place the sample bottles into a Department of Transportation (DOT)-approved container(s) in compliance with MCP-1394 and P&T instruction (after allowing for at least 12 hrs of refrigerated storage).

27. Radiation Control personnel will perform a contamination survey of the resulting package(s) and perform additional decontamination of the package(s) exterior surface(s), where necessary. Have the sample package(s) released from a contamination control standpoint. Arrange for the package(s) to be picked up by P&T and shipped to the desired analytical laboratory.

28. Clean up area, bag samples, and perform any other exit activities under Radiation Control direction. The WGS facility representative will have provided specific directions as to the management and control of any sampling generated waste. It is possible that once the samples are bagged, they will not be accessible for parafilming (VOAs excluded), which deviates from MCP-1394.

29. The logkeeper will note any physical characteristics (odor, color, any suspended materials) in the field logbook. This will likely be performed when samplers are out of the contamination control area.

30. Arrangements will have been made to transport the material from the V-tank area to a Radiological Engineering-approved storage pending coordination of packaging and off-Site shipment.

NOTE: *A sample storage refrigerator will be used, if necessary, because locked storage of high activity samples is expected by Radiological Control personnel pending shipment off-Site.*

31. Handle samples in accordance with the MCP-1394 unless otherwise noted in work control.

4.1.8 Sample Transport

Due to the anticipated consistency of the material and the fact that solids will be suspended in solution, solids will settle after material is sampled. The settling of solids is especially important to consider with regard to packaging and shipment. The risk assessor has determined that, while in solution, the dose rate anticipated on a 1-liter sample would be approximately 77 millirem/hour (mRem/hr); however, once the sludge has settled out, the bottom phase may exhibit a dose rate of 274 mRem/hr per liter at the bottom and 121 mR/hr on the side of the bottle (at contact). This information has been provided to SAM, project representatives, and the facility P&T representative. Actions are being taken to ensure that the special packaging and components of that packaging will be readily available when sampling occurs. It is expected that the final radiological readings will be taken just prior to packaging the samples and that packaging will occur at least 12 hours following sample collection (to allow for sufficient settling of the waste prior to packaging and shipment). The specific sample location and analyses to be performed are identified in Table 4-1.

Preliminary calculations showed that the samples can be shipped in strong tight packaging under an exclusive use shipment. As much as possible, shipping documentation will be prepared, and packaging and packaging materials will be identified prior to sampling. However, final packaging and shipping will be in accordance with P&T procedures and DOT regulations. P&T will be notified at least one week in advance of the actual sampling in order to prepare the appropriate documentation and schedule the transport vehicle.

4.1.9 Waste Management

Wastes generated during the characterization project will include sampling equipment—wipes, funnel, secondary containment, and PPE. WGS personnel will coordinate waste disposal activities in accordance with INEEL procedures. Waste will be bagged, labeled, and stored in an approved storage area pending disposition. The project manager, with assistance from WGS, will prepare waste determination and disposition forms for determining the disposition routes for all waste generated during sampling and analysis.

The project has requested that the following information be communicated to the performing laboratory:

- All sample material, altered and unaltered, are to be returned to the INEEL as defined in the TOS
- The altered and unaltered samples can be mixed with each other
- The sample waste (altered and unaltered) can be returned to the bulk consolidated waste tank without adding any more waste codes
- All waste must be characterized, and WGS personnel must preapprove returning the sample material to the V-tank consolidated waste.

4.2 Sample Analysis

The INEEL SAM will approve the laboratory performing sample analysis. This laboratory will analyze the samples in accordance with project requirements and ER-SOW-394, "Idaho National Engineering and Environmental Laboratory Sample and Analysis Management Statement of Work for Analytical Services" (2005).

Project-specific request for analyses forms or TOS(s) identify additional requirements for laboratory analysis. The following sections identify analysis requirements for the characterization project.

4.2.1 Analytical Methods

To ensure that data of acceptable quality are obtained from the characterization project, standard EPA laboratory methods will be used to obtain sample data (see Section 3.2). Analytical methods to be used for this characterization project are identified in the laboratory contract. All special conditions and handling to meet project DQOs must be specified in the project-specific laboratory contract.

The non-characteristic confirmation must be performed to complete RCRA/TSCA hazardous waste determination and to demonstrate that the V-tank waste meets or does not meet the ICDF Waste Acceptance Criteria (WAC). The project will follow standard analytical procedures (SW-846 Method 8260B for volatiles, 8270C for semivolatiles, 6010B for metals, and 7470A for mercury).

If necessary, evaluations will be performed utilizing SIM (Section 7.5.12 for 8260B, Section 7.5.5 for 8270C) for the targeted organic contaminants identified in Tables 3-1 and 3-2 immediately following standard analytical methods. This will be performed using the same prepared samples used for standard analytical methods. If higher resolution equipment is required for any of these organics, the extraction procedures will also use the same prepared samples, but with analyses conducted via either the high-resolution gas chromatograph (GC)/low-resolution mass spectrometry (MS) equipment described in Method 8280 or the high-resolution GC/high-resolution MS equipment described in Method 8290.

The removal of sample material from each sample container must be performed in a manner that provides a representative portion of sludge and supernatant material in each sample. The analytical laboratory makes the final determination on how to accomplish this. All analytical laboratory activities associated with sample removal needs to be performed in accordance with sample preparation measures documented in SW-846.

Any deviations from this information will be fully documented, and the laboratory will inform the project manager of the deviations.

Applying conditions of elevated temperature sparging/boiling or chemical oxidation shall not be performed until written approval to proceed has been obtained from the project engineer. The project engineer will be responsible for reviewing the results of the most recent analyses before deciding if further treatment is required for either the non-characteristic confirmation or the Phase 1 treatment evaluation objectives.

4.2.2 Instrument Calibration Procedures

Laboratory instrumentation will be calibrated in accordance with the specific laboratory quality assurance plan. The SAM analytical laboratory authorization processes provide assurance that the analytical laboratories authorized to perform analysis maintain an appropriate laboratory quality assurance plan that addresses instrument calibration.

4.2.3 Laboratory Records

Laboratory records are required to be maintained in accordance with the specific laboratory quality assurance plan. The SAM analytical laboratory authorization processes provide assurance that the analytical laboratories authorized to perform analysis maintain an appropriate laboratory quality assurance plan that addresses laboratory records.

4.3 Data Management and Document Control

4.3.1 Data Reporting

The project has requested preliminary information via a 14-day facsimile from the laboratory with a 21-calendar-day standard deliverable to follow for the complete summary data package for this work. The final data package documentation will conform to the criteria specified in ER-SOW-394. The ER Statement of Work (SOW) prepared by the INEEL SAM is the standard means by which analytical data deliverable requirements are defined by INEEL projects to laboratories used by the INEEL. All laboratories used by this project will adhere to the documents used to establish technical and reporting standards.

4.3.2 Data Validation

Analytical data validation is the comparison of analytical results versus the requirements established by the analytical method. The purpose of the data validation effort is to determine whether the resulting analytical data are technically and legally defensible and reliable. The validation effort involves the evaluation of all sample-specific information generated from sample collection to receipt of the final data package. As such, the validation process is generally not initiated (and cannot be completed) until after all data packet deficiencies (if encountered) have been resolved. This is commonly done via a request for data resubmittals from the analytical laboratory. The final product of the validation process is the validation report. The validation report communicates the quality and usability of the data to the decision-makers. Included in the final report is information related to the qualification of all data, including the identification of any flagged data and the reason and impact of the flagging.

The data for this project require rush validation. Level B validation is requested for all sample data reports generated during this project. The validation report will contain an itemized discussion of the validation process and results. Copies of the data forms annotated for qualification will be attached to the report.

4.3.3 Data Quality Assessment

The project data quality assessment and validation process is used to determine whether the data meet the project DQOs. Additional steps of the data quality assessment process may involve data plotting, testing for outlying data points, and other statistical analyses relative to the characterization project DQOs.

Assessment of the data to determine data precision, accuracy, representativeness, reproducibility, and completeness will be performed in accordance with QAPjP DOE-ID-10587 (2004).

4.3.4 Final Characterization Report

A final characterization report will be prepared for this project per applicable program requirements. Donna Kirchner (6-9873) is the ESP point of contact for review of data and issuance of the closure report summarizing the sampling activity and the findings. The WGS facility representative will work with the ESP point of contact in requesting specific information be included in the summary tables so that the data can be used to facilitate preparation of the Integrated Waste Track System profile. The final report will contain a summary of all of the sample data generated during this sampling effort, the log notes, the pertinent notes to the file, the Chain of Custody forms, and the final sampling plan. The final report will also describe the sample collection effort, including any items that might impact the quality of the data. A description of the data quality assessment process may also be included. The final report will discuss how the data will be used. The DQOs will be reviewed and evaluated to determine if the characterization project objectives were met.

4.3.5 Document Control

Refer to MCP-9227, “Environmental Services Project Logkeeping Practices” (2004) and MCP-1394, “Managing Hazardous Samples” (2005). Document control consists of the clear identification of all project-specific documents in an orderly form, secure storage of all project information, and controlled distribution of all project information. Document control ensures controlled documents of all types related to the project will receive appropriate levels of review, comment, and revision as necessary. The project manager is responsible for properly maintaining project documents according to INEEL document control requirements. Upon completion of the characterization project, all project documentation and information will be transferred to compliant storage according to project, program, and company requirements. This information may include field logbooks, Chain of Custody forms, laboratory data reports, engineering calculations and drawings, and final technical reports.

5. HEALTH AND SAFETY REQUIREMENTS

As previously discussed, this sampling activity will be covered under Standard (STD)-101 (2005) work control, Work Order no. 89636, and the *Health and Safety Plan for V-Tank Area CERCLA Site Remediation at Test Area North, Waste Area Group 1, Operable Unit 1-10* (ICP 2005) provided by project personnel. Work will also be governed under a task-specific Radiological Work Permit (RWP). An ESP representative will review the work control documents to ensure that all sampling hazards are addressed and mitigated. All job hazards along with corresponding mitigation requirements are documented in the work order. The project is responsible for ensuring that the cognizant health and safety professionals review and approve the health and safety documentation.

6. REFERENCES

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DOE-ID, 2003, *Technology Evaluation Report for the V-Tanks, TSF-09 and TSF-18, at Waste Area Group 1 (WAG-1) Operable Unit (OU) 1-10*, DOE/ID-11038, Rev. 0, April 2003.

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EDF-4885, 2004, "Reevaluation of Characteristic Toxicity Designation For V-Tank Waste, Using Existing Sample Data," Rev. 1, August 2004.

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EDF-6584, 2006, "Homogenization of T-Tank Wastes using 2-Tank Mixing Cycles and Continuous 3-Tank Mixing." Rev. 0, January 2006.

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ICP, 2005, *Health and Safety Plan for the V-Tanks Area CERCLA Site Remediation at Test Area North, Waste Area Group 1, Operable Unit 1-10*, ICP/EXT-04-00429, Rev. 5, November 2005.

ICP-MCP-9439, 2004, "Environmental Sampling Activities at the INEEL," Rev. 0, June 2004.

MCP-1394, 2005, "Managing Hazardous Samples," Rev. 0, September 2005.

MCP-3003, 2005, "Performing Pre-Job Briefings and Documenting Feedback," Rev. 13, March 2005.

MCP-3472, 2005, "Identification and Characterization of Environmentally Regulated Waste," Rev. 1, January 2005.

MCP-9227, 2004, "Environmental Services Project Logkeeping Practices," Rev. 6, October 2004.

Services Authorization Form 3389.

STD-101, 2005, "Integrated Work Control Process," Rev. 7, September 2005.

TEM-104, 2005, "Model for Preparation of Characterization Plans," Rev. 2, August 2005.

Appendix A

Sampling and Analysis Plan Table

Sampling and Analysis Plan Table for Chemical and Radiological Analysis

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DRAFT

Plan Table Number: ESP-122-04

SAP Number: ICP/EXT-04-00659

Date: 12/09/2004 Plan Table Revision: 0 Project: ESP-122-04, TAN V-TANK CONSOLIDATION AND POST SPARGING OPERA Project Manager: BINGHAM, W. ALVAH/JESSMORE, J. J.

Sampler: Haney, D. F.

SMO Contact: ELDER, T. E.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																			
										AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
Sampling Activity	Sample Type	Sample Matrix	Coll Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth (ft)	TI	TA	TV	VL	VM															
VTK004	REG	WASTE	GRAB		01/02/2005	V-TANK	CONSOLIDATION	#1	NA	1	1	1		1															
VTK005	REG	WASTE	GRAB		01/02/2005	V-TANK	CONSOLIDATION	#2	NA	1	1	1	1																
VTK006	REG	WASTE	GRAB		01/02/2005	V-TANK	CONSOLIDATION	#3	NA	1	1	1	1																
VTK007	QC	WATER	TBLK		01/02/2005	V-TANK	TRIP BLANK	QC	NA			1	1																

The sampling activity displayed on this table represents the first 6 to 9 characters of the sample identification number. The complete sample identification number will appear on the sample labels.

AT1: TCLP Metals
AT2: TCLP SVOCs
AT3: TCLP VOCs
AT4: VOCs (CLP TAL)
AT5: VOCs (CLP TAL) - MS/MSD
AT6:
AT7:
AT8:
AT9:
AT10:

AT11:
AT12:
AT13:
AT14:
AT15:
AT16:
AT17:
AT18:
AT19:
AT20:

Comments:
Sample VTK00401TA and VTK00401TV shall contain sample volume for required MS/MSD for TCLP VOC and TCLP SVOC analyses.

Analysis Suites:

Contingencies: